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IMPLICATIONS OF CHILD GROWTH AND DEVELOPMENT FOR SCHOOL PLANT DESIGN.

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IT IS THE BELIEF OF SOME THAT SCHOOL PLANTS ARE FOR CHILDREN. TO SERVE AS A STUDY GUIDE FOR IMPLEMENTATION OF THIS BELIEF, THIS PAPER PRESENTS PRINCIPLES, NEEDS OF CHILDREN, AND A LIST OF SUGGESTED READING. BASIC PRINCIPLES DISCUSSED ARE--(1) DEVELOPMENT IS A PRODUCT OF TWO FACTORS--LEARNING AND GROWTH, (2) HUMAN GROWTH AND DEVELOPMENT FOLLOW AN ORDERLY PATTERN, (3) INDIVIDUALS DIFFER IN RATE, PATTERN, AND ULTIMATE LEVEL OF DEVELOPMENT, AND (4) ALL ASPECTS OF GROWTH AND DEVELOPMENT ARE INTERRELATED. A LIST OF CHARACTERISTICS AND NEEDS PECULIAR TO PRIMARY, PRE-ADOLESCENT, AND ADOLESCENT STUDENTS AND A SET OF NEEDS COMMON TO ALL CHILDREN ARE GIVEN. (JT)

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by RALPH W. CHERRY

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INTELLIGENT planning of a building of any kind must take into account the characteristics and needs of the users. School buildings may serve adults in a number of important ways but they should be planned primarily for children and youth. Therefore, school plant planners must give prime consideration to the nature and needs of children.

Extensive and exacting research in child growth and development has revealed many facts and principles which have important implications for the school plant. Some indicate how the educational program should be arranged and operated, indirectly affecting plant planning. Others provide more direct suggestions concerning the design and equipment of school buildings.

Many school plant planning teams do not include a member who is familiar with the findings of research in child growth and development. The task of securing and interpreting the information is difficult but worth the effort. This report is designed to help make the job a little easier.

It is impossible, of course, to present here a summary of all of the important findings of research which have building implications. This report attempts, then, to indicate the various types of information which can and should be obtained and to suggest some good sources for further study.

There are some general principles of development, supported by research, which have an important bear-

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THE PROBLEM:

"School plants are for children." So often we have heard that expression. But how many school planners really know and understand children—their needs, how they grow and how they develop? Very few. Yet we continue to plan plants throughout the United States with very little understanding of the young people who must use them. When we, as school planners, find out about children—our real clients—then we can expect our schools to become more truly functional, that is, schools which serve emotional functions as well as physical ones. It is hoped that this report will point a direction of study for those who believe that "school plants are for children," and that the planning of school plants must be preceded by careful study of child growth and development.

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ing on educational practice. Four of them are presented here, with a few comments concerning their implications.

Four Basic Principles

One basic principle is that *development is a product of two factors–learning and growth.* The growth factor operates not only in the physical sphere but also in the realm of mental and social activities. The stage of growth which a child has reached determines to a great extent what he can do and will strive to do. It also affects his emotional response to various situations. This principle emphasizes the importance of adapting learning experiences and facilities to the growing abilities of the child. To provide the right opportunities–equipment, facilities, encouragement and guidance–at the right time requires a knowledge of the range of abilities at each stage of growth. Research has not given complete answers to these questions but has revealed a great many facts which have not yet been accorded the attention they deserve.

A second principle is that *human growth and development follow an orderly pattern.* The sequence of events is likely to be much the same in all children in the process of development toward maturity. It is possible to establish age and sequence norms for children

The primary school child is full of activity, but is easily tired. The daily program should include time for quiet individual work.

of the same age or stage of growth. Such norms are very useful in planning and evaluating educational programs and facilities. They indicate how a school program or a building can be scaled to the size of the pupils.

Another principle is that *individuals differ in rate, pattern and ultimate level of development.* Here is the well known and highly significant fact of individual differences. It has a great many implications but there is one which seems all-important: an educational program designed to serve all children must include a great many activities and areas of learning and should be as flexible as possible. The provision of space and equipment for such a program is the resulting challenge to school plant planners.

The fourth and final principle to be stated here is that *all aspects of growth and development are interrelated.* For example, the development of appropriate motor skills is important to a child's social and emotional welfare. It is essential to the total development of a child that adequate opportunities and facilities for appropriate physical activities be provided. Also, emotional conditions influence social and mental behavior and vice versa. Attention to factors which have a bearing on the affective life of a child is of great importance for many reasons.

Classroom facilities should provide for a variety of activities.

Dearborn Public Schools

These four principles provide a general orientation for the interpretation and application of the specific facts learned from the study of children. We turn now to a consideration of some of the specific characteristics and needs of children of various ages.

The Primary School Child

One significant fact about a six-year-old is that he is usually confused and perplexed when introduced to a new situation or environment. The transition from home to school is difficult for many children. It is made somewhat easier if the school is a small, homelike structure rather than an imposing edifice. The neighborhood primary school is one answer to this problem. Where circumstances require that larger schools be provided, a separate wing for the primary grades is suggested.

The normal child in the primary grades is full of activity but is easily fatigued. Self-activity is his special vehicle for attaining wholesome growth. He likes and needs to handle and investigate objects. A classroom designed for sitting only has no place here. Space must be available for a variety of activities. Provision for rest periods should be made, also.

The average child in this age group is learning personal cleanliness and how to control his bodily func-

tions. He needs assistance and guidance which can be provided best if the facilities needed are a part of the classroom. The location of toilet facilities in each primary room is clearly desirable.

Normally, the period from age six to nine or ten is one of slow, steady growth and development. Not much that is helpful to the school plant planner has been revealed by research concerning the middle and late years of childhood. Many of the facts about younger children apply with considerably less force, however. Classrooms should continue to provide space for learning by doing and should be made as attractive and comfortable as possible. Whether toilets should be placed in the individual rooms or in a central but readily accessible location is a moot point.

The Pre-Adolescent

The play activities of older children require more space and equipment and more attention to the differing interests and needs of boys and girls. The importance of motor learnings at all stages of growth has already been mentioned. The need is particularly great in the period of middle and late childhood. Adequate space and equipment is imperative.

A thumb-nail sketch of the pre-adolescent in grades six, seven or eight includes:

- Secondary sex characteristics begin to develop. Girls mature from one to two years earlier than boys.
- Muscular growth is rapid.
- Uneven growth of different parts of the body makes for awkwardness, restlessness, laziness.
- Appetite is enormous.
- Individual differences are great.
- Special interests emerge.
- Acceptance by peer group assumes great importance.
- Adjustment to a changing body is a serious problem for many.
- A desire for increasing independence is apparent.

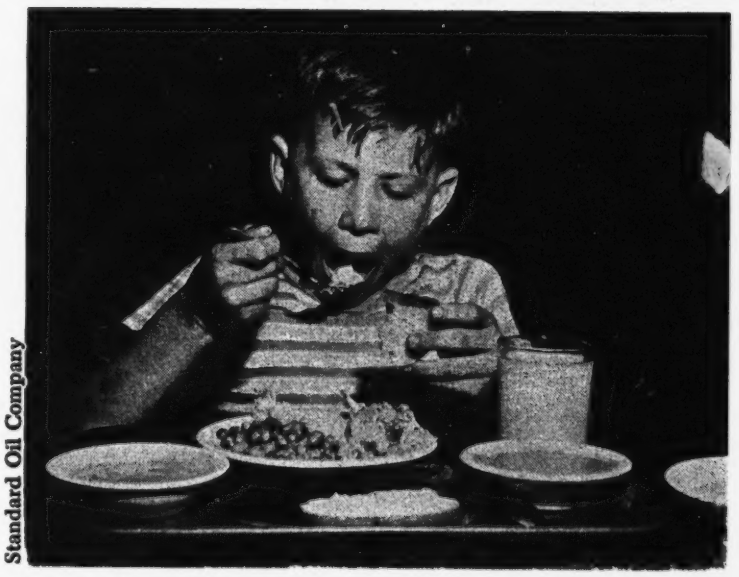
The special characteristics of the pre-adolescent offer definite suggestions to planners of programs and buildings. In the first place, it is clear that the personal and social problems of boys and girls are of paramount importance. Opportunities and facilities for individual counseling and for social learnings should be provided. Second, to meet the problems created by the wide range of individual differences in abilities, needs and interests, a flexible program embodying many types of activities is demanded.

The conventional, departmentalized program is not appropriate to the needs of this age group. Yet there are some valid, practical objections to the single-teacher-per-class idea. Emerging special interests of the pre-teens should not be ignored. Perhaps the solution is a gradual transition from the self-contained classroom of the elementary school to a departmentalized program in the last two years of high school. Decisions on these points, which must be made locally, will carry with them some implications for classroom design and equipment.

A third special problem of the pre-adolescent, which demands attention, is food—lots of it. They want it and need it in great quantities. A well equipped, attractive lunchroom is a must. Snack bars are desirable and should be planned if possible. A fourth need is for physical facilities and programs which will help the boy or girl to overcome the awkwardness so characteristic of this period.

The Adolescent

Many of these same problems and needs continue into adolescence. Acceptance by the peer group, for example, becomes even more important. Physiological changes are pretty well completed but concern with these changes persists. The range of individual differences increases and special interests become more pronounced. Boys begin to catch up with girls in pubescent changes, but girls are still more advanced in many ways. The desire for independence grows stronger, but the assurance of security remains important.

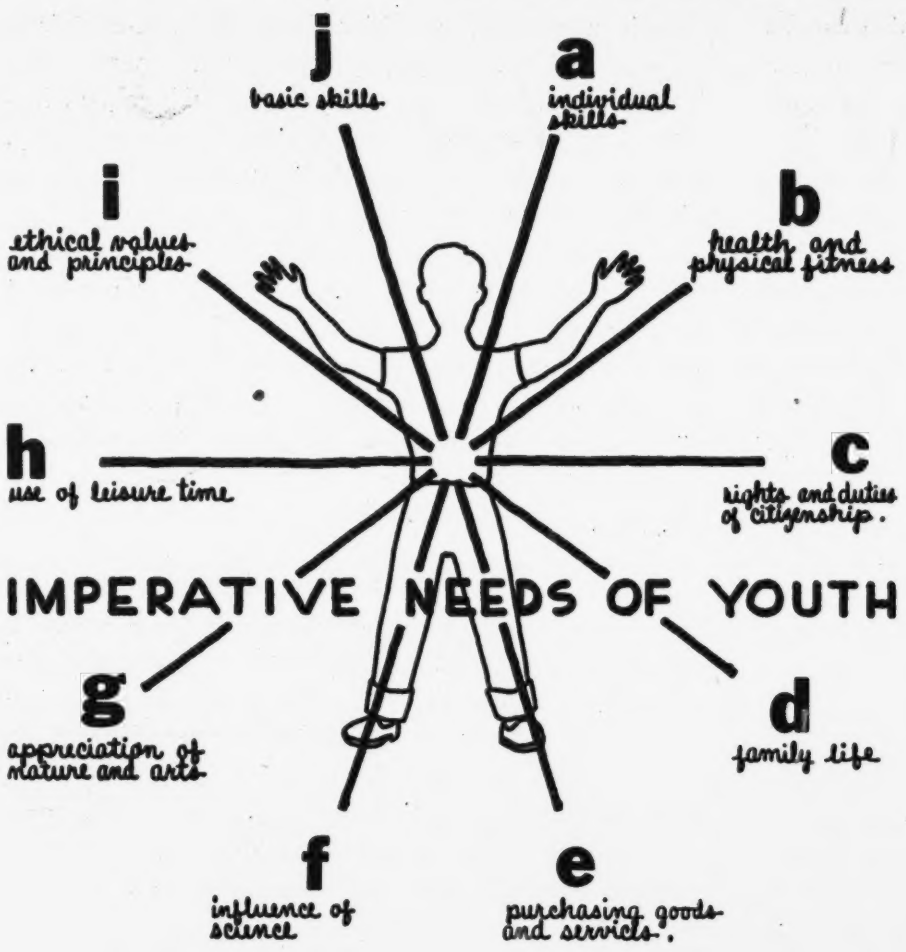


Standard Oil Company

A special problem of pre-adolescents is satisfying their enormous appetites. They want and must have great quantities of good food.

Recent proposals to change the curriculum of the high school by taking into account the special needs and characteristics of adolescents have had little effect on practice to date. Such changes are sure to come, however. Unless plant designers try to foresee them, the high school buildings constructed this year and next will soon be obsolete.

Facing this dilemma, the architects of the recently completed Norman, Oklahoma, High School adopted the approach of utilizing a statement of "the ten imperative needs of youth." This statement, contained in a pamphlet called "Planning for American Youth," is



The ten imperative needs of youth form a basis for curriculum planning and school design. The ten needs are adapted from the book, *Education for All American Youth*, published by the Educational Policies Commission.

derived from a book published by the Educational Policies Commission, entitled *Education for All American Youth*. A revised edition of the latter is now available and is included in the references listed below. This statement of the needs of youth is an attempt to translate what we know about adolescents into a form which will serve as a basis for curriculum planning.

The point is that a high school, designed in accordance with the needs and characteristics of youth, will be somewhat different from one planned to serve the present curriculum. School plant planners, with an eye to the future, must look for guidance directly at the known facts about youth. One suggestion is to involve youth in the planning.

Common Needs of All Children

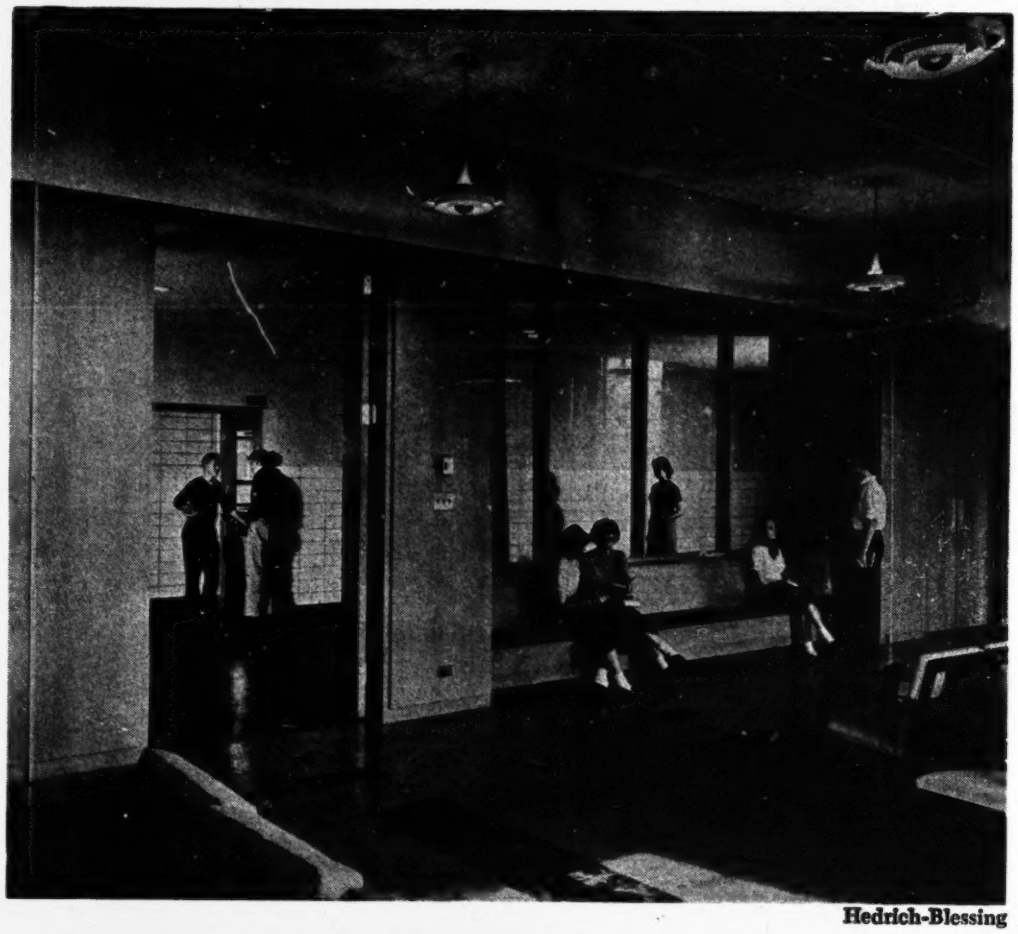
Some common needs of children of all ages must also be considered in the planning of school buildings. Physical comfort, safety and health are a main concern. No building can be considered good unless it provides for the visual comfort and efficiency of every child wherever he sits and whatever he does. New standards have been derived from a great deal of excellent research. The real test is not whether certain standards (foot-candles, brightness-balance or what-have-you) are met, but whether every child can see well enough to do what is planned without strain.

A satisfactory thermal environment is equally important and the test is the same—the comfort and health of the pupils. In this connection, the stubborn fact is that children's comfort demands somewhat lower temperatures than are commonly maintained in classrooms. Adults have a basal metabolism rate which is lower and thus require higher temperatures. Women require a higher room temperature than men for the same reason. As yet, however, no one claims to know all of the answers. For now, it is best to rely upon the latest technical knowledge available and continue to check the effects on pupils.

Good hearing conditions are also essential. The test is whether or not pupils can hear what is meant to be heard and are undisturbed by extraneous sounds. With reference to the latter, it can be said with certainty that noises unrelated to the learning process reduce learning efficiency and frequently produce irritation. Children differ greatly in their reaction to noise, but it is known to reduce accomplishment and increase error. Achieving the desired result is a complex, technical problem.

Scaling every feature of the building and every piece of equipment to the size of pupils is still another factor. Information about the height of the average child can be obtained from the department of health or from a physician. These measurements should be checked locally and translated into specifications for furniture and equipment, doorknobs, sinks and so on. Equipment manufacturers have done a part of this job. Testing by pupils is recommended, too.

The psychological comfort of pupils is a problem which is just beginning to be recognized. Not much



High school students need informal areas where they can meet with each other and with their teachers in a relaxed and social atmosphere. This student lounge is located in the Evanston Township High School, Evanston, Illinois, Perkins and Will, Architects-Engineers.

Hedrich-Blessing

Chicago Public Schools

Use of the outdoors livens the day's activities for adolescents and helps to relieve any feelings of rigid authority being imposed on them by the school program.

definite evidence is available as yet. This fact makes it all the more important to use all that we do know. To create a cheerful, friendly atmosphere is one goal. Color and other means of decoration get into the picture. What children like should be considered. Saturated colors appeal to the young child while adolescents prefer pastels. Colors akin to those found in nature seem most desirable. A few attractive pictures (to children, that is) add something to a room, as do growing plants. And all of this should be harmonious in the eyes of the child.

The Child Is the Yardstick

The point of all that has been said in this report is simply that the child is the only yardstick by which a building can be properly measured and evaluated. That being true, why not learn all that we can about children before or during the planning of a building?

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